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Spatiotemporal dynamics of vapors of chloride matrices in a transversely heated graphite furnace for atomic absorption spectrometry

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Abstract

The dynamic of the formation and dissipation of sodium and nickel chloride vapors in the THGA transversely heated graphite furnace atomizer of a SIMAA 6000 multielement spectrometer was investigated by shadow spectral filming. The spatial distribution for the entire vaporization cycle of vapors is strongly inhomogeneous, due mainly to the transverse non-isothermal conditions of the atomizer. It also depends on the addition of a chemical modifier and the rate of the internal flow of the sheath gas. At the normal brightness of the spectral lamps, the spectrometer's Zeeman-based background corrector reliably compensates for the nonselective light absorption by molecular vapors and condensed particles with an amplitude of up to 1. For the minimum allowable brightness of lamps, this value decreases to as low as 0.6 because of an increase in the noise of the measurement path.

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